Operation Manual

English



atexMIXdrive **order no.: 49001**

with

atexMIXcontrol cleanroom **order no.: 99300**

Includes:

Quick start
Operation Manual
Technical Documentation
Specifications

Thank you for your confidence shown in us!
Congratulations to the purchase of your new product.
For any enquiries, questions or suggestions please do not hesitate to contact us at info@2mag.de.

2mag
Main competence of **2mag** is based upon mixing, tempering and measuring/controlling. In these fields we are offering support with our products to the modern laboratory within the standardized daily business as well as for the implementation of highly complex processes in the state-of-the-art research. Due to the fact that **2mag** is developing according to customer's needs, is manufacturing self-contained and under permanent quality control and is also selling on-site together with competent contact persons, we can guaranty our customer an outstanding quality and product performance.

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A Quick start

1. Overview of your product

Magnetic stirrer atexMIXdrive with control unit atexMIXcontrol



Image 1: 1-position magnetic stirrer atexMIXdrive with control unit atexMIXcontrol cleanroom

Your product contains at despatch:

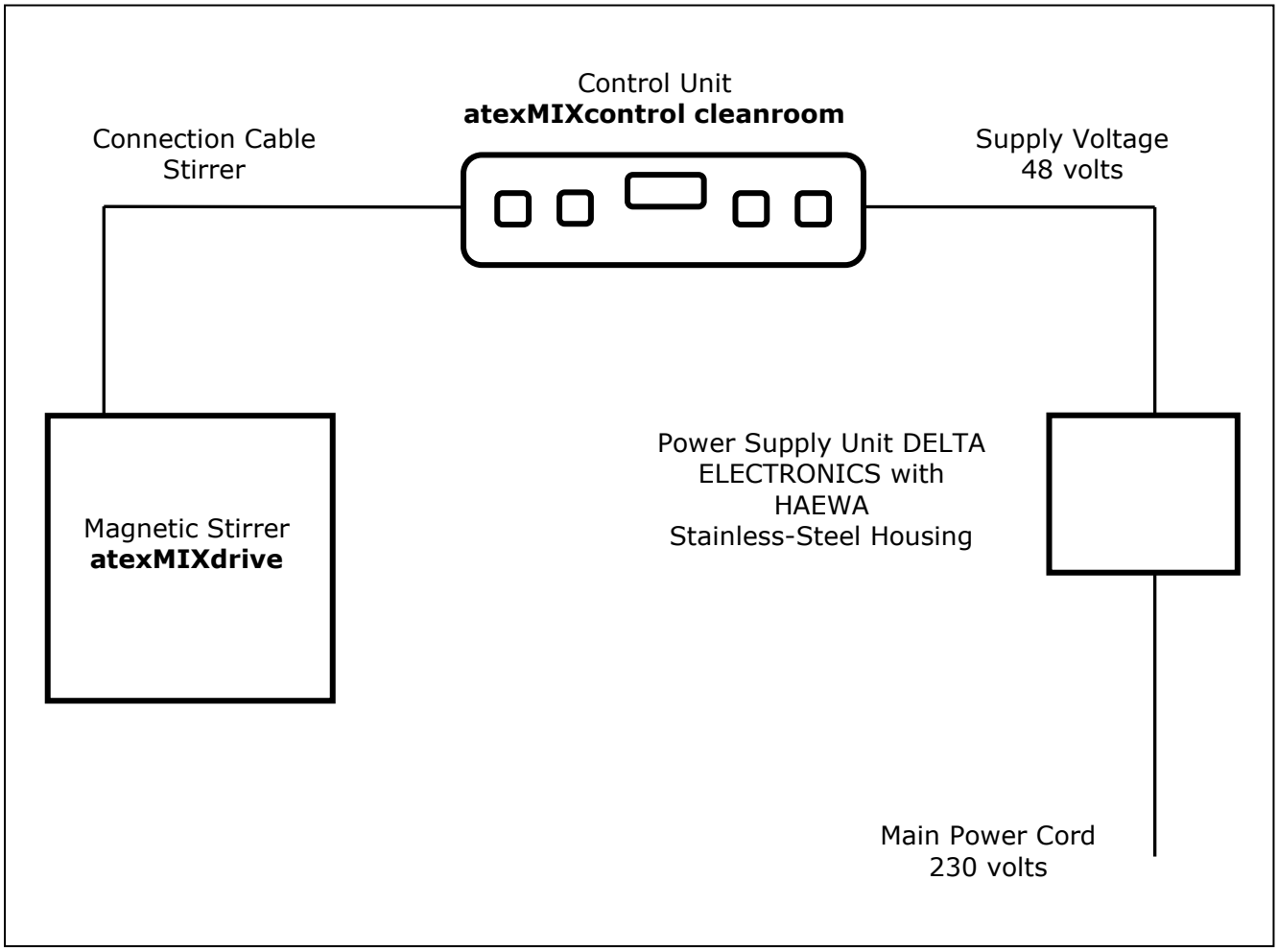
- A modern inductive magnetic stirring system according to ATEX directives (atexMIXdrive) consisting of a **stainless steel stirring plate with 1 stirring point** with fixed stirrer control cable
- An external **control unit according to ATEX** directive (atexMIXcontrol cleanroom) with one fix connected inductive magnetic stirrer (atexMIXdrive)
- An external **DELTA ELECTRONICS power supply unit, integrated in a special designed HAEWA stainless-steel housing** with fix connected control unit atexMIXcontrol clean room and fix connected main power cable.
- Folder with documentation and certificates

All three stirring system devices are fix connected and not designed to disconnect. Please note the graphics (drawing 1) or image 2.

The main power cord of the HAEWA stainless-steel housing is equipped with a standard 230 volts main power plug (German version only) to have the possibility to test the stirring system.

It is NOT allowed to use the stirring system with this test main plug in explosion protected zones and areas.

For using the stirring system in explosion protected zones and areas the test main plug MUST be changed to an ATEX certified main power plug by authorized and trained specialists.



Drawing 1: Overview stirring system – diagram of all components

2. Application fields

2.1 Operator

The 100% maintenance- and wear-free magnetic stirrer **atexMIXdrive** are used in the fields of chemistry, medicine, pharmacy, microbiology and biotechnology.
The operators are generally working in research and development, production and quality assurance.

The magnetic stirrer system is made for using in ex-proof zones.

The magnetic stirrer is having safety level Ⓔx II 2G Ex mb IIC T4 Gb.

The control unit is having safety level Ⓔx II 3G Ex nA nL IIC T6.

The DELTA ELECTRONICS power supply unit is having safety level
Ⓔx II 3G ex IIC T4 Gc and
II 3G ex nC IIC T4 Gc

The „HAEWA"-stainless-steel housing of the power supply unit is having the safety levels Ⓔx II 2 G Ex eb IIC und Ⓔx II 2 D Ex tb IIIc

The main power cord of the HAEWA stainless-steel housing is equipped with a standard 230 volts main power plug (German version only) to have the possibility to test the stirring system.



It is NOT allowed to use the stirring system with this test main plug in explosion protected zones and areas.

For using the stirring system in explosion protected zones and areas the test main plug MUST be changed to an ATEX certified main power plug by authorized and trained specialists.

2.2 Basic functions

Basic function is stirring of liquids in suitable and chemically resistible vessels.
The stirrer housing is hermetically close and therefore immersible.
The maximum ambient temperature is +40°C in air and +40°C in water immersed.

2.3 Product combinations

In addition to the use at the conventional laboratory desk our products have also been tested for the application in

- Laminar flow devices
- Safety cabinets
- Safety cabins
- Water baths
- Incubators
- Ex-proof zones, please see "2.1 Operator"

Please note: For using the stirrer in incubators please set the adjustable stirring power to the minimum usable power to reduce the additional heating effect caused by the magnetic stirring drive. Please see chapter "5 External heating operations in incubators and water baths" at page 16.

2.4 Application not for the intended use

The magnetic stirrer **atexMIXdrive** is **explicitly not intended** for the application:



- Warming of pressure-tight closed and NOT pressure-resistant vessels or glasses (**risk of bursting**) (e.g. Erlenmeyer flasks, lab flasks)

2.5 Combinations of vessels

Please use round, chemical resistant and where required heat-resistant vessels made of glass or non-magnetic metal. You can use vessels up to the maximum size stated in the spreadsheet 1.
The vessels should have a thin, even wall thickness. Flat glass bottoms (without any curve to the inside) and smooth surfaces will improve the operating characteristic of the magnetic stirring bar. Uneven surfaces would reduce the stirring power and would cause reaming up of the stirring bar's gliding surface.
In case you intend to stir large amount of liquids, please chose such stirring flasks that have a comparatively small diameter and thin bottom. The magnetic stirring bar can then be centred better.

Magnetic Stirrer	Stirring vessels	Nominal content	Max. amount
atexMIXdrive with **atexMIXcontrol cleanroom**	Erlenmeyer flasks lab flasks beaker glasses	10.000 ml	1

Spreadsheet 1: Combination examples for vessels



Please always place the flasks in the magnetic centre of the magnetic stirrer. This will ensure the optimum stirring effect!



Do never use any pressure-tight closed flasks which are not made for use under pressure.

RISK OF BURSTING!



Do only use temperature-resistant vessels.
Be careful with plastic flasks!

2.6 Stirring bars

In general, all stirring bars matching the length and diameter can be used. But we recommend using the commercial stirring bars with Samarium Cobalt magnetic core (SmCo). By using this highly energetic magnetic material the maximum stirring power of the magnetic stirrer can be achieved, especially when mixing viscose media.

2.7 Tips and hints to the topic stirring

The mixing flasks should be filled max. up to the middle (high speed range) resp. up to ¾ (low speed range).

Place one magnetic stirring bar in each stirring flask.

Place the stirring flasks right in the centre of the stirring point.

In case the magnetic stirring bar turns in an unsteady or jerky way or bounces:
The interaction between the alternating magnetic field and the magnetic stirring bar is too high.

- Increase the speed or
- Use a smaller magnetic stirring bar or
- Decrease the stirring power.

In case the magnetic stirring bar will not be centred or leaves the centre permanently:
The interaction between the alternating magnetic field and the magnetic stirring bar is too low.
Or the stirring bar has a bottom that is uneven or too thick-walled.

Move the flask slightly back and fro and centre it again onto the stirring point of the stirrer surface.

- Reduce the speed or use a longer magnetic stirring bar or one with a larger diameter or
- Use a smaller flask with a thin-walled, even bottom or
- Reduce the filling amount in the flasks or
- Increase the stirring speed.

In case the stirring activity is too weak:

- Use commercial magnetic stirring bars with SamariumCobalt-core.
- Use a longer stirring bar or a stirring flask with smaller diameter.

3. Installation

3.1 Safety advice

Please ensure the following basic conditions prior to installation:



The wear-free inductive drive works with magnetism. **Cardiac pacemakers, data storage mediums, magnetic cards and other devices,** which can be affected by magnetic fields, have to be kept away from the fields of the stirring unit as well as from the stirring bars.



The control unit must not be dipped in water or any cleaning solutions.



Your supply voltage has to comply with the label of the control unit.



To increase the operation safety, the control unit should be placed apart from chemical materials and reactions as well as away from thermal influences.
For special requirements please contact info@2mag.de.



The installation and connection of the stirrer with the control unit as well as opening of the controller housing is ONLY allowed by authorized and trained specialists!



ATTENTION!
Disconnect ALWAYS the main power BEFORE you handle the cables/wires or open the control unit.



WARNING:
Electro static charging of the stirrer atexMIXdrive is possible!
Therefore cleaning **ONLY** with wet wipe!



WARNUNG:
Electro static charging of the control unit atexMIXcontrol cleanroom is possible!
Therefore cleaning inside ex-proof zone 2 ONLY with wet wipe or alternatively cleaning ONLY outside the ex-proof zone!



Note:
Max. stirring power 20 watts!
Should not be used the control unit atexMIXcontrol, in this case can be used ONLY the control unit types MIXcontrol eco and MIXcontrol 20.



Important note:
Both alternatively listed control units are **NOT** designed for using in ex-proof zones and have to be used **ONLY** outside of ex-proof zones.



atexMIXdrive is NOT approved for using with control unit MIXcontrol 40!

ATTENTION
The main power cord of the HAEWA stainless-steel housing is equipped with a standard 230 volts main power plug (German version only) to have the possibility to test the stirring system.



It is NOT allowed to use the stirring system with this test main plug in explosion protected zones and areas.

For using the stirring system in explosion protected zones and areas the test main plug MUST be changed to an ATEX certified main power plug by authorized and trained specialists.

3.2 Installation, connection to control unit atexMIXcontrol cleanroom

ATTENTION!
Disconnect ALWAYS the main power BEFORE you handle the cables/wires or open the control unit.

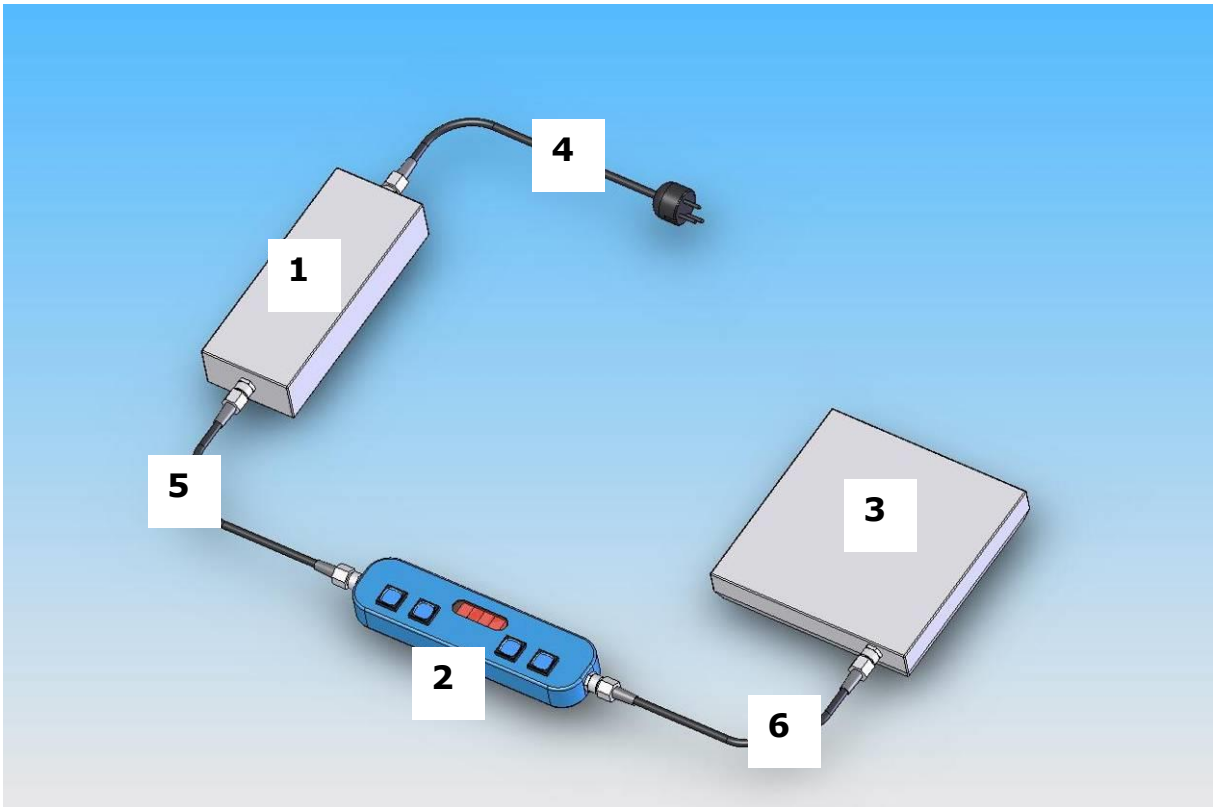


Image 2: Magnetic stirrer atexMIXcontrol with control unit atexMIXcontrol cleanroom and power supply unit

Description function elements - control unit

1 Power supply unit atexMIXcontrol cleanroom
2 Control unit atexMIXcontrol cleanroom
3 Magnetic stirrer atexMIXdrive

4 Power cord for main connection – please read following hint
5 Low voltage cord (fix connected)
6 Connection cable for stirrer (fix connected)

All wires of the complete system (image 2) are fixed and cannot be disconnected.
Therefore it is NO installation between stirrer and control unit and power supply unit needed.

ATTENTION
The main power cord of the HAEWA stainless-steel housing is equipped with a standard 230 volts main power plug (German version only) to have the possibility to test the stirring system.



It is NOT allowed to use the stirring system with this test main plug in explosion protected zones and areas.

For using the stirring system in explosion protected zones and areas the test main plug MUST be changed to an ATEX certified main power plug by authorized and trained specialists.

4. Operating of the Control Unit

4.1. Operating of the control unit atexMIXcontrol cleanroom

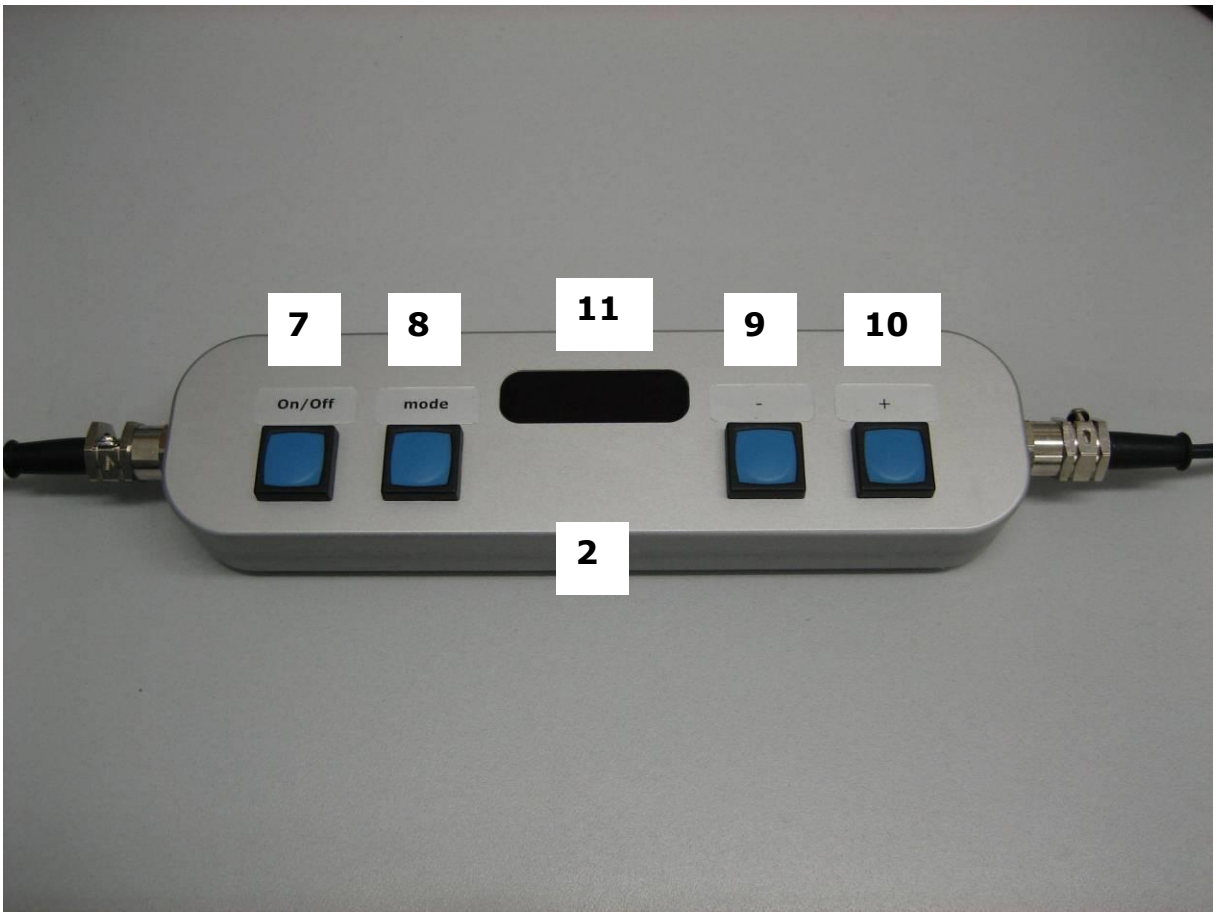


Image 3: Operation elements, control unit atexMIXcontrol cleanroom

4.1.1 Description function elements atexMIXcontrol cleanroom

2 Control unit atexMIXcontrol cleanroom

Stirrer control

7 Pushbutton / key „ON/OFF" for magnetic stirrer
8 Pushbutton / key „MODE" for power setting of the magnetic stirrer
9 Pushbutton / key „MINUS" for decrease of the stirrer speed
10 Pushbutton / key „PLUS for increase of the stirrer speed

11 Display for speed and power setting

Operating of the control unit

After correctly installation according valid regulations of the main power cord (4) by an authorised person the magnetic stirrer system atexMIXdrive with atexMIXcontrol cleanroom will be ready for operation.

4.1.2 Stirring operation and stirrer control atexMIXcontrol cleanroom

Turning On and Off
Please press the ON/OFF-key (7) once. The magnetic stirrer will be switched on by that. The current stirring speed will be shown in the display (11).
By pressing the ON/OFF-key (7) once more, the magnetic stirrer will be switched off again. The display indicator (11) expires.

SoftStart
After the magnetic stirrer was switched on, the stirring bars in the flasks will first be caught, afterwards centred in the flask and then – to increase the operating safety – be smoothly accelerated to the set speed accurately.
The accelerating phase will be shown by the illumination of a dot at the right segment of the LED-display (11).

Power adjustment
A newly developed and extremely efficient magnetic stirrer will come into operation.
The inductive drive concept causes an operational heat output by the magnetic stirrer. To reduce the heat output the power of the magnetic stirrer can be adjusted.
A **high power** setting is necessary to mix viscose media and large amounts to be stirred in a strong and efficient way.
A **low power** setting guaranties a warming-free long-term use for example of aqueous probes at room temperature.

The stirring power can be adjusted in four steps by using the MODE-key (8).
By pressing the MINUS-key (9) respectively the PLUS-key (10) just after pressing the MODE-key, the power can be adjusted between 25/50/75/100%.

The current value is now shown on the display (11). The display (11) will turn back to the current speed indicator after approx. 5 seconds.
The power adjustment is finished again at the time the speed range is shown.
The power adjustment can also be finished immediately by pressing the MODE-key (8) again.

Stirrer speed adjustment
The speed of the magnetic stirrer can be adjusted by pressing the MINUS- (9) resp. the PLUS-key (10).
The adjusted speed will be shown in the display (11) when the magnetic stirrer is switched on. The speed range can be adjusted between 100 and 2000 rpm in steps by 10.
By constantly pressing the MINUS- resp. the PLUS-keys, an accelerated adjustment of the speed can be achieved.

QuickSet
To enter the start- respectively maximum speed directly and quickly there is the Quickset-function available.
The use of the following described keys will be made with the stirrer turned on.
Setting the Start Speed
Press the MINUS-key (9) permanently and press shortly the ON/OFF-key (7) afterwards. The start speed "100" will be set.
Setting the Maximum Speed
Press the PLUS-key (10) permanently and press shortly the ON/OFF-key (7) afterwards. The maximum speed "2000" will be set.

Display, Magnetic Stirrer
The display (11) provides as described above a description of:

- Current stirring speed (always with switched on magnetic stirrer)
- Set power (after pressing the MODE-key (7))
- To check, whether the magnetic stirrer is switched on. The display will not be illuminated in case the stirrer is switched off.



The wear-free inductive drive works with magnetism. **Cardiac pacemakers, data storage mediums, magnetic cards and other devices,** which can be affected by magnetic fields, have to be kept away from the fields of the stirring unit as well as from the stirring bars.



5. External heating operation in incubators and water baths



- **Do not heat up liquids whose flashpoint is lower than the set temperature.**
  Explosion hazard! Fire hazard!



- **Do never use any pressure-tight closed vessels**

  RISK OF BURSTING!



- **Please use only temperature-resistant vessels**
  Beware of plastic vessels!

6. Maximum operation temperatures



- **Incubator operation**
  Please note the **maximum operation temperature +40 °C** in air for the standard versions



- **Water bath operation:**
  Please note the **maximum operation temperature +40 °C** in water immersed for the standard versions

B Maintenance, Cleaning and Care



Do not use any cleaning agent or cleaning rag that is based on chlorine with metallic components or ammoniac.
These agents may harm the surface.



WARNING:
Electro static charging of the stirrer atexMIXdrive is possible!
Therefore cleaning **ONLY** with wet wipe!



WARNUNG:
Electro static charging of the control unit atexMIXcontrol cleanroom is possible!
Therefore cleaning inside ex-proof zone 2 **ONLY** with wet wipe or alternatively cleaning **ONLY** outside the ex-proof zone!



The control unit must not be dipped in water or any cleaning solutions.

2mag devices are generally maintenance-free.

Due to their construction the **2mag** devices are very robust and designed for the professional daily use.

We recommend cleaning the devices' surfaces with f. ex. cleaning agents containing tensides or isopropyl alcohol regularly.

BEFORE cleaning the surfaces, switch off the device with the power switch and pull out the power cable afterwards.

C Service case and customer service



During service, the device may only be opened by an authorized customer service.

In case of any defect on the device, please make sure to contact us first. We will be ready to offer help quickly and straightforward.

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GERMANY

Fon: +49 89 3815311-0
E-Mail: info@2mag.de
Web: www.2mag.de

Warranty:

Due to their construction, the **2mag** devices are very robust and designed for the professional daily use.

The magnetic drive works without any mechanically moved parts as e.g. belts, bearings or motors. Therefore a maximum of reliability within daily use is achieved.

Should in any case, despite our strict quality control, a system part not work without any fault, it can be repaired or exchanged by our customer service without any problems.

We give 2 years warranty on all material and manufacturing defects.

D Errors

The magnetic stirring bar is turning in an unbalanced way:
There is no denying that magnetic stirring bars are aging in the course of time. This may happen by e.g. sterilizing, usage at high temperatures or causing stress (dropping down). The magnetism can be decreased by this. Separate out this stirring bar and exchange it by a new one.

The control unit is not ready for operation despite the power connection has been made and the power switch had been turned on:
Please get into contact with us.

In general, we are ready to help you in case of problems.
For any enquiries, questions or suggestions please do not hesitate to contact us at info@2mag.de

E Technical details

Magnetic stirrer atexMIXdrive

	atexMIXdrive
Order no.	49001
Stirring points	1
Stirring volume/point	10,000 ml
Stirring power (max.)	max. 20 watts
Material housing	stainless-steel
Material sealing	PUR, ATEX conform
Permitted operation conditions (air)	-10 up to +40 °C (at 100% humidity)
Permitted operation Conditions (water)	+40 °C in water immersed
Measurement (WxDxH)	180 x 180 x 38 mm
Weight	approx. 3.5 kg
Permitted storage conditions	-40 °C up to +70 °C, 10 – 95 %, 500 - 1060 hPa
Protection category	IP 68
Ex-proof mark (category)	Ex II 2G Ex mb IIC T4 Gb
Certificate no.	EPS 22 ATEX 1 010 X
Operating voltage	48 VDC

Type label magnetic stirrer atexMIXdrive

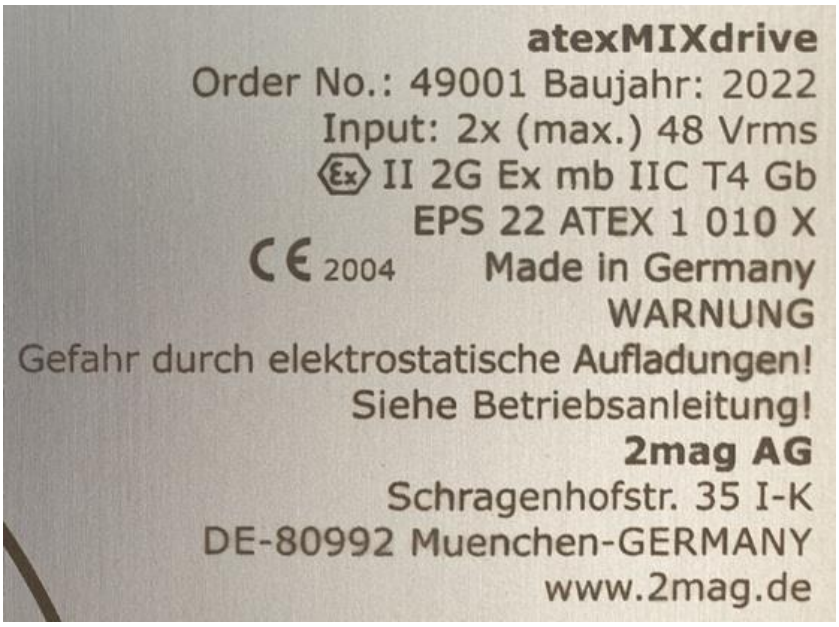


Image 4: Type label, magnetic stirrer atexMIXdrive (sample)

Control unit atexMIXcontrol

	atexMIXcontrol cleanroom
Order no.	99300
Speed range	100 – 2,000 rpm
Stirring power	max. 20 watts
Stirring power steps	adjustable, 4-steps (25/50/75/100%)
Voltage output	48 VDC
Housing material	aluminium
Housing sealing	PUR, ATEX conform
Measurements (WxDxH) control unit	205 x 55 x 30 mm
Measurements (WxDxH) Power supply unit	150 x 150 x 150 mm
Weight	approx. 3.6 kg
Permitted operation conditions	0 up to +40 °C (at 80% humidity)
Permitted storage conditions.	-40 °C up to +70 °C, 10-95 %, 500-1060 hPa
Protection category	IP 65
Ex-proof mark (category)	Ex II 3G Ex nA nL IIC T6
Certificate no.	EPS 10 ATEX 1 246 X
Electrical data	100-240 V / 50-60 Hz / 1.5 A

Type label control unit atexMIXcontrol cleanroom

2mag AG
Schragenhofstr. 35 K
DE-80992 Muenchen
GERMANY www.2mag.de
atexMIXcontrol cleanroom- Order No. 99300
Herstellungsjahr: 202X
Ex II 3G Ex nA nL IIC T6
EPS 10 ATEX 1 246 X CE
Made in Germany

WARNUNG:
Gefahr durch elektrostatische Aufladungen!
Siehe Betriebsanleitung.

Type label power supply unit DELTA ELECTRONICS inside HAEWA-stainless-steel housing

Power Supply Unit
Delta Electronics
DRP048V060W1BX
60W / 48V / 1.25A
II 3G ex IIC T4 Gc
II 3G ex nC IIc T4 Gc
EPS 12 ATEX 1 491 X

Please see for detailed information the DELTA ELECTRONICS data sheet.

Type label HAEWA-housing

2mag AG–www.2mag.de
Power Supply Unit of
atexMIXcontrol cleanroom
Order No. zu 99300
Input: 100-240 VAC/1.25 A
Ser.-No: zu 17xx00x
Made in Germany CE

II 2 G EX eb IIC
II 2 D Ex tb IIIC
EPS 09 ATEX 1 175 U
Häwa GmbH & Co. KG
Industriestr. 12
DE-88489 Wain, Germany

Please see for detailed information the HAEWA data sheet.

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